

# Combined Geodetic Surveying Methods for 2D Flood Modeling

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## SUMMARY

Application of 2D hydraulic modeling (2D modeling) is rapidly becoming the preferred analytical approach across a broad spectrum of study types, including transportation hydraulic studies, bridge scour, flood control design, river restoration, habitat evaluation, floodplain mapping, and many others. The amount, the quality, and the type of data necessary to create 2D models vary depending on the model application and the feasibility of obtaining the data. Compared to other data types, terrain data is the most important data set for 2D modeling, because the terrain has the most influence on the movement of water for open channel flow. Terrain data typically takes the most resources to obtain a sufficient representation of a project area. Therefore, it is crucial to choose a geodetic method to collect spatial data in order to ensure, at the same time, a high accuracy, the required substrate details, and an efficiency of the procedure. Due to the development of geodetic technologies in the last few decades, nowadays are available various and mutually compatible geodetic instruments and methods of obtaining high-precision spatial data. Having in mind the specific needs of hydrographic and hydraulic research and analysis, for the generating of adequate geodetic substrate, the integration of topographic and bathymetric methods of land surveying is most often necessary. In this paper a combined method of terrain data collecting with LiDAR (Light Detection and Ranging) and Echo Sounder System will be presented, along with the final results of 2D flood modeling on the example of "Moravian Corridor Highway Project". The aim of the proposed method is to provide a complete picture of the river catchment, its facilities and river structures for modeling process, in order to contribute to the development of safe and rational technical solutions and high-quality construction of motorway structures and river regulation.